A Survey of End Users, VARs, and OEMs in the Market for UNIX-Based Relational Data Base Management Software

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Introduction

Introduction

RICOH Corporation retained INPUT to assist in evaluating market opportunities for its internally developed GraphBase relational data base management product, running under UNIX on DEC VAX and MicroVAX minicomputers and Sun Microsystems workstations.

INPUT's objectives focus on:

- Understanding customer needs
- Identifying VAR and OEM distributors
- Finding beta sites for GraphBase

To accomplish this research, INPUT conducted telephone surveys, using a structured questionnaire. Separate questionnaires were designed for VARs, OEMs, and end users.

Since it was assumed that local companies could be better supported from RICOH's office in Santa Clara, INPUT agreed to focus interviewing efforts on companies located in the Bay Area. Please refer to Exhibit I-1.

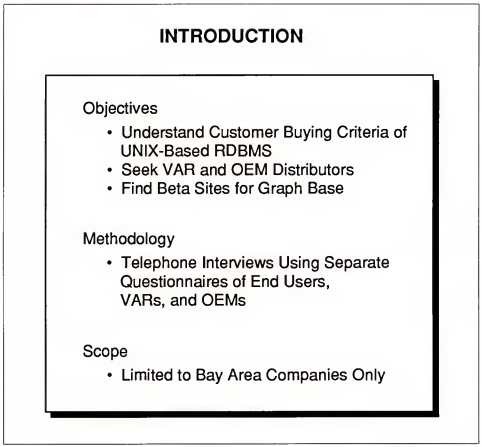
A Structure and Content of This Report

This report is divided into three main sections:

- Summary Information about Respondents
- Comparative Summaries of Findings
- Appendices (with tabulated responses to individual questions)

Narrative is provided for the first two sections; the exhibits with tabulated responses to individual questions are presented in the three Appendices.

EXHIBIT I-1



B

Respondent Profile

INPUT focused its survey efforts on end users, followed by VARs and OEMs. Exhibit I-2 indicates the number of respondents by category.

EXHIBIT I-2

SURVEY RESPONDENT PROFILE

Category	Number of Respondents
End Users	11
VARs	10
OEMs	6
Total	27

C

End-User Respondent Profile

As shown in Exhibit I-3, INPUT contacted mainly manufacturing, medical, software, and educational organizations. Eight of the 11 respondent organizations used proprietary versions of UNIX; three used standard versions of UNIX; and one used both proprietary and public versions of UNIX.

Respondents were screened to ensure that:

- Their organization uses the UNIX operating system
- They were personally knowledgeable about the use of a UNIX-based RDBMS product

EXHIBIT I-3

END-USER RESPONDENT PROFILE

Category	Organization	UNIX Version(s)
Manufacturing	Cirrus Logic	Proprietary
	Ardent Computer	UNIX
	Convergent	Proprietary
	Sun	Proprietary
	Zeta Labs	Proprietary
	Elxsi	
	Silicon Graphics	
Software	Baron Data Systems	Proprietary
Medical	Stanford Med. School	UNIX
	UCSF Med. School	Proprietary
Education	U.C. Santa Cruz	Proprietary/ UNIX

D

Value-Added Reseller (VAR) Respondent Profile

Of the three categories of survey respondents, the VAR category is the most diverse. INPUT interviewed five software vendors, three hardware vendors, and two consultants who develop applications for end users.

As shown in Exhibit I-4, software vendors and consultants generally support more than one version of the UNIX operating system. It appears that smaller software vendors and consultants support more than one version of UNIX whereas larger vendors have committed to supporting a single UNIX version.

EXHIBIT I-4

VALUE-ADDED RESELLER (VAR) RESPONDENT PROFILE

Category	Organization(s)	UNIX Version
Software Vendors	Garnet Technology	V, BSD, Xenix
	Pacific Micro Group	Unspec, Xenix
	RJE Communications	V
	Enigma Logic	III, V, BSD
	Teknowledge Corp.	Proprietary
Hardware Vendors	DSC/Granger	Sun O.S.
	Modulers Data System	V
	DCA/Cohesive Networks	Proprietary, BSD
Consultants	Sobell Associates	V, BSD, Xenix
	Ralmar Business Systems	V

INPUT surveyed VAR respondents in all categories—one with revenues in excess of $100 million, many with "less than $1 million" and some in the "$15 to $25 million" category.

Among the nine VAR respondents, all had some percentage of their business in UNIX. UNIX represented 100% of the business at four VARs and 1% to 25% at three VARs, as indicated in Exhibit I-5.

EXHIBIT I-5

VAR RESPONDENT INFORMATION

1987 Revenues	Number of Respondents
> $100 Million	1
< $25 Million	2
< $15 Million	1
< $2 Million	1
< $1 Million	5
Total	10

Percent of Business in UNIX	Number of Respondents
100	4
51-100	1
26-50	1
1-25	3
Unknown	1
Total	10

All Vendors Either:
- Currently Sell UNIX-Based Applications (9)
- Or Plan to Sell UNIX-Based Applications (1)

All Vendors Note Increasing Purchases of UNIX-Based Applications

Nine vendors currently sell UNIX-based applications. Since all 10 vendors noted increasing purchases of UNIX-based applications, UNIX is rapidly gaining market acceptance.

The VARs surveyed target the full spectrum from small to large companies, with an equal number separately targeting small, medium, and large firms.

The VARs surveyed conduct business from a local level to an international level, with four VARs doing business internationally. The remaining respondents were divided evenly between U.S. and Bay Area/California target customers.

EXHIBIT I-6

OTHER INFORMATION ABOUT VAR RESPONDENTS (N=10)

Target Customers

- 4 of 10 Target Small/Medium/Large Organizations
- 2 of 10 Target Medium/Large Organizations
- 2 of 10 Target Large Organizations
- 2 of 10 Target Small/Medium Organizations

Geographic Areas

- 4 of 10 Target International Locations
- 3 of 10 Traget U.S. Locations
- 2 of 10 Target Bay Area Cities
- 1 of 10 Targets Customers in California

E

Original Equipment Manufacturer (OEM) Respondent Profile

The OEMs interviewed included manufacturers of mainframes, minicomputers, and workstations. INPUT contacted one mainframe manufacturer, four manufacturers of minicomputers, and one manufacturer of workstations.

As indicated in Exhibit I-7, OEM respondents support:

- Proprietary versions of UNIX
- Berkeley Systems Development (BSD) versions
- Release V of AT&T UNIX.

Since survey respondents did not identify any versions of AT&T System III, it now appears that System V is the new "standard" for commercial UNIX.

EXHIBIT I-7

OEM RESPONDENT PROFILE

Category	Organization	UNIX Version
Mainframes	Amdahl	Proprietary
Minicomputers	MIPS Computer	Proprietary
	ACER/Counterpoint	V
	Tolerant Systems	V, BSD
	Ridge Computers	Proprietary
Workstations	Sony Microsystems	BSD

Target survey respondents' revenues spanned the range from "less than $1 million" to "greater than $1 billion."

UNIX usage among customers of this OEM group is consistent with UNIX usage by VARs, detailed above. All six vendors sell UNIX-based applications and report an increase in their UNIX-based business.

EXHIBIT I-8

OEM RESPONDENT INFORMATION

1987 Revenues	Number of Respondents
> $1 Billion	1
< $25 Million	2
< $5 Million	1
< $1 Million	2
Total	6

All 6 Vendors Now Sell UNIX-Based Applications

All 6 Vendors Report an Increase in UNIX-Based Business

Summary Information

Summary Information

A

Installed Relational Data Base Management Software (RDBMS)

Respondents to the survey were identified through the use of user group lists, knowledge of the local market for UNIX software, industry periodicals, and industry directories. Therefore, the distribution of survey respondents will not match the "true" distribution of installed UNIX-based RDBMS.

INPUT's survey found a relatively heavy concentration of installed Unify, Informix, and Oracle RDBMS products. End users and VARs were the heaviest users of Unify, while the OEMs contacted usually used Informix.

Although the usage of leading RDBMS software is important, the survey also uncovered usage of secondary RDBMS—Sybase, Relational Technology Inc. (RTI), Progress, Safe Word, and Digital Equipment Corporation's "rdb" product.

EXHIBIT II-1

SUMMARY—INSTALLED RDBMS

Vendor	End User	VAR	OEM	Total
Unify	5	5	3	13
Informix	2	3	4	9
Oracle	—	1	3	4
RTI	1	—	1	2
Sybase	1	—	1	2
DEC/RDB	1	—	1	2
Progress	—	—	1	1
Safe Word	—	1	—	1
Total	10	10	14	34

B

Top Buying Criteria

In one of the first questions, INPUT asked respondents to list their top three buying criteria for RDBMS software. INPUT asked end users to list four criteria in the hope that they would provide at least three responses. Respondents fully answered the question. This was asked as an open-ended question—that is, one without any prompts or clues about the responses sought. Responses are summarized in Exhibit II-2.

EXHIBIT II-2

SUMMARY—TOP BUYING CRITERIA (Open-Ended Question)

Criterion	End User	VAR	OEM	Total
Price/Cost of Porting	3	5	2	10
Performance/Speed	5	3	1	9
UNIX Compatibility	4	2	—	6
Application Development Features	2	1	—	3
Market Acceptance	—	—	3	3
Ease of Use	—	3	—	3
Terms & Conditions	—	—	2	2
Portability	—	2	—	2
Functionality	2	—	—	2
Data Integrity	1	1	—	2
Availability	—	—	1	1
Build Solutions	—	—	1	1
Reliability	—	1	—	1
Flexibility	1	—	—	1
Easy-to-Use SQL	1	—	—	1

Respondents identified a total of 15 separate buying criteria. The total number of responses permitted a division into three major categories—primary, secondary, and tertiary. The primary responses can be summarized as:

- Price (includes "Cost of Porting")
- Performance
- Compatibility with UNIX

Each of the top three factors contained responses by end users, VARs, and OEMs. In other words, all respondent categories mentioned each factor enough times to warrant inclusion in the primary category.

In discussing each factor, INPUT assumes UNIX compatibility for this market. Important system software, then, is bought on nearly the same major criteria as hardware. End users and VARs emphasize price and performance whereas OEMs mentioned UNIX compatibility.

More revealing are the top three secondary attributes:

- Application development features
- Market acceptance
- Ease of use

Each factor was identified primarily by one category of respondent—"application development features" by end users and VARs, "market acceptance" by OEMs, and "ease of use" by VARs.

In summary, users want features, functionality, flexibility, and data integrity; VARs want ease of use, portability, reliability, and data integrity; and OEMs want market acceptance of the RDBMS and attractive terms and conditions. Each group wants the attributes it needs to be successful.

C

Ratings of Specific Buying Criteria

Following the open-ended question about buying criteria, INPUT asked for the rating of the importance of each factor on a scale of 1 to 5, with 5 indicating a high rating and 1 a low one.

At this time, please note that the criteria selected were all believed to be important in the purchase decision. The purpose of this question is to sort out the relative importance of each factor. Consistent with the design of the question, the results shown in Exhibit II-3 indicated that all factors were important, since each received a rating score greater than 3.5.

Findings are consistent with the open-ended question. VARs value application development features, pricing and discount structure, and the availability of the RDBMS on multiple platforms. OEMs value most the reputation of the RDBMS vendor and the RDBMS vendor's market share. For the OEM, the market decides which RDBMS software the company will offer. End users are most concerned about performance and SQL/ad hoc query capability, a necessary RDBMS feature.

EXHIBIT II-3

SUMMARY—RATINGS OF SPECIFIC BUYING CRITERIA

Criteria	End User	VAR	OEM
Software Development Features	—	4.5	3.6
RDBMS Vendor Reputation	—	4.0	4.5
Pricing & Discount Structure	—	4.3	4.1
RDBMS Vendor Market Share	—	3.6	4.3
Performance	4.2	3.9	3.9
SQL/Ad Hoc Query	4.2	—	—
Availability on Multiple Platforms	—	4.2	4.0
Data Base Administration Features/Ease	3.6	3.9	3.6

D

Decision Process

For VARs, end users, and OEMs, the decision process is somewhat different, dictated by the nature of each business. For example, all VARs include the vice president or director of engineering in the decision process, whereas only 40% of the OEMs surveyed did the same.

As indicated in Exhibit II-4, if the vice president/director of engineering at the OEM did not participate, then the president approved the vendor.

All end-user companies, except one medical organization, included the vice president or director in the decision process. In the medical school, decision-making authority rested solely with the medical research staff.

EXHIBIT II-4

SUMMARY—DECISION PROCESS

Process

- VARs, End Users, and OEMs have a Formal Process

Technical Evaluation

- Less than 50% of End Users and Only 75% of OEMs Conduct a Technical Evaluation (Limited OEM Sample of 4)

Decision Makers

- All VARs Include Engineering V.P./Director in Process vs. only 40% of OEMs
- For OEMs, if V.P./Director of Engineering Not Involved, Then President Must Approve
- End User Corporations Include V.P./Director in Decision Process
- Medical Schools Vest Decision Authority with Research Staff

E

Reasons for Selecting a RDBMS Vendor

The survey found nine reasons for selecting a particular RDBMS vendor. Overall, VARs identified nearly twice as many reasons as end users and nearly four times as many as OEMs, as detailed in Exhibit II-5.

Of the nine only one reason, price or cost of porting, was mentioned by users, OEMs, and VARs. Power/performance was listed only by end users and VARs, while availability/timing of completed port was identified by end users and OEMs.

EXHIBIT II-5

SUMMARY—REASONS FOR SELECTING AN RDBMS VENDOR (Number of Mentions)

Reason	End Users	VAR	OEM	Total
Price/Cost of Porting	2	2	1	5
Compatibility with Operating System	—	4	—	4
Availability/Timing of Completed Port	1	—	3	4
Power/Performance	2	2	—	4
Ease-of-Use	1	2	—	3
4GL	2	1	—	3
Portability	—	1	—	1
Future Network Version	—	1	—	1
Efficient Development Tools	—	1	—	1
Total	8	14	4	26

F

Other RDBMS Vendors Considered

The survey asked what other UNIX-based RDBMS vendors were considered in the decision making process. The major players—Oracle, Informix, RTI, Unify, and Sybase—were considered most often.

According to the information in Exhibit II-6, INPUT identified two new vendors compared to those with packages installed (please see Exhibit II-1). Interbase and Dataplex were considered, though not purchased, showing the difficulty for smaller vendors to be even considered for purchase, let alone actually purchased.

EXHIBIT II-6

SUMMARY—OTHER RDBMS VENDORS CONSIDERED

Vendor	End Users	VARs	OEMs	Total
Oracle	2	7	4	13
Informix	2	6	4	12
RTI/Ingres	2	2	4	8
Unify	2	1	3	6
Sybase	1	1	1	3
Interbase	1	-	-	1
Dataplex	-	-	1	1
Progress	-	1	-	1
Total	10	18	17	45

G

Satisfaction with Primary RDBMS Vendor

After ascertaining which RDBMS was installed and what others were considered, INPUT asked respondents to indicate their overall level of satisfaction with their primary RDBMS vendor. Respondents expressed satisfaction using a scale of 1 to 5, with 5 indicating the highest level of satisfaction.

Before discussing the findings in Exhibit II-7, please be aware that these results are based on limited interview samples. Please note that more complete information on responses by end users, VARs, and OEMs can be found in Appendices A, B, and C, respectively.

EXHIBIT II-7

SUMMARY—SATISFACTION WITH PRIMARY RDBMS VENDOR (Average Scores Reported)

Vendor	End Users	VARs	OEMs	Weighted Average
Unify	3.6	4.5	3.5	4.1
Sybase	4.0	4.0	-	4.0
Xanthe	-	4.0	-	4.0
Informix	3.0	4.3	3.2	3.6
DEC (RDB)	3.0	-	-	3.0
Oracle	-	4.0	2.0	2.7
RTI	4.0	-	2.0	3.0

On average, VARs rated their overall vendor satisfaction nearly one point higher than end users and OEMs, indicating easier grading. OEMs were, in general, the toughest graders, since their highest average rating was 3.5, just above average.

Using weighted averages, Unify Corporation received the highest level of customer satisfaction, with ratings for Sybase and Xanthe following closely. Informix, DEC, and RTI were ranked in the middle of the pack, while Oracle was the only vendor to receive a weighted average rating of less than 3.0.

H

Reasons for Not Selecting Other RDBMS

Exhibit II-8 shows the six reasons identified by respondents for not selecting a RDBMS package from other vendors.

The four OEM respondents emphasized cost of or time necessary for porting to their hardware platform and market presence of the RDBMS vendor as key reasons for not selecting an RDBMS vendor. In a similar vein, VARs focused on price and performance as the key reasons for not choosing a certain RDBMS vendor.

EXHIBIT II-8

SUMMARY—REASONS FOR NOT SELECTING OTHER RDBMS

Reason	OEM	VAR
Limited Market Presence	1	-
Time Needed to Do Porting	1	-
Price/Cost of Porting	2	4
Performance	-	4
Flat File/ISAM Access	-	2

I

Importance of Specific RDBMS Features

Respondents were asked to rate, using a scale of 1 to 5, the relative importance of nine specific RDBMS features. Results are shown in Exhibit II-9. Please recall that all features asked about are important and one purpose of the survey was to prioritize the relative standing of these features.

To end users and VARs, the most important features, in order of decreasing importance, were:

- Host language interface
- Form generation and windows
- 4GL
- ANSI standard SQL

To OEMs, the four most important features were, in order of decreasing importance:

- 4GL
- ANSI standard SQL
- Embedded SQL
- Report writer

EXHIBIT II-9

SUMMARY—IMPORTANCE OF SPECIFIC RDBMS FEATURES

Criterion	End Users	VARs	OEMs
Host Language Interface	4.5	4.1	4.0
Form Generation & Windows	4.5	4.3	3.4
4GL	4.4	4.0	4.4
ANSI Standard SQL	4.3	4.2	4.4
Report Writer	3.7	3.9	4.2
On-Line Help Facility	3.7	3.9	3.6
Embedded SQL	3.6	3.3	4.3
System-Generated Menus	3.5	3.3	3.4
Transaction Control	3.5	3.8	4.0

EXHIBIT II-10

SUMMARY—ADDITIONAL FUNCTIONALITY DESIRED

OEMs and End Users

- Friendlier User Interface
- Easy-to-Customize RDBMS

VARs

- More Tools

J

Desired Pre-Sale Support

As shown in Exhibit II-11, end users offered more than one and one-half times as many specific pre-sale support services as did OEMs and five times as many as VARs.

EXHIBIT II-11

SUMMARY—DESIRED PRE-SALE SUPPORT (Number of Mentions)

Capability	End Users	VARs	OEMs	Total
Good Technical Support/ Access to Tech Staff	2	2	4	8
Demo/"Play with It"	4	-	1	5
Documentation	1	-	1	2
Sample Programs	1	-	-	1
Competitive Analysis of RDBMS Vendors	1	-	-	1
Understanding of User's Application	1	-	-	1

End users, VARs, and OEMs agree that good technical support with access to the technical staff is the most important pre-sale service a vendor can offer. Since less than three-fourths of buyers conduct a formal technical evaluation, access to the "techies" is necessary to get answers to specific questions.

Users and OEMs would like the opportunity to see a thorough demonstration of the product's capabilities and to "play with the software."

Interestingly, one end user and one OEM indicated they would like to review the documentation before making the purchase decision. To some buyers, a thorough examination of the documentation will reveal as much as a standard product demonstration.

One interesting suggestion, made by an end user, concerned using created sample programs as a basis for customization to the user's application.

K

Desired Post-Sale Support

When asked to list desired post-sale support, end users and VARs provided nearly the same number of suggestions, followed fairly closely by OEMs. The results are presented in Exhibit II-12.

EXHIBIT II-12

SUMMARY—DESIRED POST-SALE SUPPORT (Number of Mentions)

Capability	End Users	VARs	OEMs	Total
Technical Support	4	5	3	12
Fast Response	2	-	-	2
Good Documentation	1	1	-	2
Timely Software Updates	1	-	1	2
Reasonably Priced Upgrades	1	-	-	1
"800" Phone Number	-	-	1	1
Training for Software Developer's Staff	-	1	-	1
Extended Time for Bug Reporting	-	1	-	1

The most desired post-sale support service is technical support, which received 12 mentions across the three respondent categories, thus making tech support a vendor requirement.

The next three suggested areas for support each received a total of two mentions, indicating they are somewhat important:

- Fast response
- Good documentation
- Timely software updates

While not stated specifically, fast response is related to technical and sales support. Responsiveness is key to customer satisfaction.

L

Desired "Other" Services

INPUT asked respondents an open-ended question if there were any other services they would like to see. As indicated in Exhibit II-13, most services are already offered. However, the survey uncovered a few novel ideas.

EXHIBIT II-13

SUMMARY—DESIRED "OTHER" SERVICES (Number of Mentions)

Service	End Users	VARs	OEMs	Total
Bug Lists/Updates	1	1	1	3
Bulletin Board for Users	1	1	-	2
Affordable Training	-	1	-	1
Sample Applications	-	1	-	1
Marketing Assistance	-	-	1	1
Training for Sales Support Personnel	-	-	1	1
Porting Assistance	-	-	1	1
Consulting	-	-	1	1

Electronic bulletin boards for users to share ideas and information; sample applications as a basis for developing customized, complex applications; and training for OEM sales support personnel are ideas worth considering further.

M

Importance of Specific Support Services

INPUT asked respondents to rate the importance of each of six specific support services. The results, shown in Exhibit II-14, are relatively consistent with the findings from the open-ended question, discussed above in Exhibit II-13.

The most desired support services are, in order, software bug fixes, telephone hotline support, and published bug lists. End users' preferences were: bug fixes, followed by hotline support and software updates. VARs preferred that vendors offer bug fixes, a published bug list, and telephone hotline support. OEMs wanted bug fixes, followed by a tie between software updates and hotline support.

End users, VARs, and OEMs agreed on the two least important services—a limited need for training for software developers and end users and a very limited need for consulting.

EXHIBIT II-14

SUMMARY—IMPORTANCE OF SPECIFIC SUPPORT SERVICES

Service	End Users	VARs	OEMs	Weighted Average
Software Bug Fixes	4.5	4.6	5.0	4.65
Telephone Hotline Support	4.4	4.4	4.6	4.46
Published Bug List	4.1	4.6	4.4	4.34
Software Updates	4.2	4.3	4.6	4.31
Training for Software Developers & End Users	3.4	3.2	3.6	3.35
Consulting	2.7	2.6	3.2	2.77

III

Conclusions and Recommendations

Conclusions and Recommendations

A Conclusions

Market

- UNIX-based applications are increasing.
- The four major RDBMS vendors (Oracle, Informix, Relational Technology (RTI), and Unify) have a substantial combined market share, making it very difficult for a new vendor to successfully market a new product.

Buying Criteria

- OEM and end-user buyers of UNIX-based RDBMS software want primarily:
  - Low price,
  - High performance, and
  - Compatibility with a particular version of UNIX.
- OEMs are a special case. They also want:
  - The RDBMS to port their product to the hardware at low cost and with a very rapid time-to-market,
  - Market acceptance of the RDBMS before they buy, and
  - Favorable terms and conditions.

Product Features

- The most important features to OEMs, VARs, and end users are 4GL and ANSI standard SQL.

- To VARs and end users, host language interface and form generation and windows are important.
- To OEMs, report writer is also an important product feature.
- As the market matures, such differentiators as a more friendly user interface, an easy-to-customize RDBMS, and additional development tools are sought by users.

Support Services

- Since relational DBMS producers are complex and are crucial to many new customer applications, technical support is now a required service.
- Vendors could offer such services as:
  - Electronic bulletin boards for users of their products to share information
  - Published bug lists
  - Scheduled releases of software updates

B Recommendations

- Do not compete directly in the market for UNIX-based RDBMS software due to:
  - Established competitors
  - Strong end user name recognition of the five main competitors
  - Extensive features of products sold by established vendors
  - Shortening product development cycles
- Consider using RICOH Corporation's GraphBase product together with specialized peripherals manufactured by Ricoh Corporation to create an embedded application, such as:
  - Document storage and retrieval system
  - Image storage and retrieval system
  - Factory/office communication/electronic mail system
  - System to help manage document flows within a work group
- In order for RICOH to be successful, it must emphasize marketing and support, specifically:
  - Position its products to leverage the strengths of GraphBase; i.e., the storage of binary data, a graphical user interface, and support for networking.
  - If porting to hardware, develop an aggressive porting policy to avoid barriers to establishing market presence.

- Devise a different pricing policy for a standalone RDBMS product.
- Ensure reliable software and emphasize this key factor in marketing literature and advertisements.
- Establish a clearly defined support policy including bug reporting, tracking, dissemination, and fixing.

Appendix: Tabulated End-User Responses

Appendix: Tabulated End-User Responses

EXHIBIT A-1

END USERS' INSTALLED RDBMS

Vendor	Number Installed
Unify	5
Informix	2
RDB (Berkeley)	1
Sybase	1
RTI	1
Total	10

EXHIBIT A-2

TOP 4 END-USER BUYING CRITERIA

Criterion	Number of Mentions
Performance/Speed	5
Compatibility with UNIX	4
Price	3
Functionality	2
Application Development Features	2
Flexibility	1
User Interface	1
Data Integrity	1
Easy-to-Use SQL	1

EXHIBIT A-3

END-USER RATING OF SPECIFIC RDBMS BUYING CRITERIA (N=14)

	Criterion	Average Rating (1-5)
High	Performance	4.22
	SQL/Ad Hoc Query	4.22
Medium	User Interface	3.89
	Documentation	3.78
	4GL	3.75
Low	Ease of DB Administration	3.56
	Application Portability	3.33

EXHIBIT A-4

END USERS' DECISION PROCESS

Decision Process

Category	Number of Respondents
No Response	4
Technical Evaluation	4
Limited Technical Evaluation	1
No Technical Evaluation	2
Total	11

Decision Makers
Corporation—Directors and VPs
Medical Schools—Research Staff
Universities—N/A (Want Public Domain Software)

EXHIBIT A-5

END USERS' REASONS FOR RDBMS SELECTION

Vendor	Reasons
Unify	4GL (2), Price, Ease of Screen Writing, Performance
Informix	Price, Flexibility, Speed
Sybase	Availability, Features
RTI	Public Domain Software

EXHIBIT A-6

OTHER RDBMS CONSIDERED BY END USERS

Vendor	Number of Mentions
Informix	2
Ingres	2
Oracle	2
Unify	2
Sybase	1
Interbase	1

EXHIBIT A-7

END-USER SATISFACTION WITH PRIMARY RDBMS VENDOR (Limited Sample)

Vendor	Number of Responses	Average Score	Range
Unify	5	3.6	2-4
Informix	3	3.0	3
RTI	1	4.0	4
DEC (RDB)	1	3.0	3
Sybase	1	4.0	4
Total	11	N/A	N/A

N/A Indicates "Not Applicable"

EXHIBIT A-8

ADDITIONAL RDBMS FEATURES/FUNCTIONS DESIRED (1 Mention Each Unless Shown Otherwise)

Performance-Related

- Improved Performance (Informix)
- Improved Batch Process (Unify)
- SQL without Memory Penalty (DEC RDB)

Operations-Related

- On-Line Backup and Reconfiguration without System Shutdown (Unify)
- Improved Integration with 4GL (Unify)
- "True" DBMS (Sybase)
- Handle Recursive Access (Unify)

Features-Related

- Improved Graphics (Unify)
- Graphics Interface (2, Informix and RTI)

EXHIBIT A-9

IMPORTANCE OF SPECIFIC RDBMS FEATURES (N = 9, 10, OR 11)

Feature	Rating (1-5)
Host Language Interface	4.5
Form Generation & Windows	4.5
4GL	4.4
Ansi Standard SQL	4.3
Report Writer	3.7
On-Line Help Facility	3.7
Embedded SQL	3.6
System-Generated Menus	3.5
Transaction Control	3.5

EXHIBIT A-10

ADDITIONAL FUNCTIONALITY DESIRED BY END USER (One Mention Each)

Strategic

- Distributed Data Base Capability (Unify)

Tactical

- Ease of Data Base Administration (DEC RDB)
- Fast and Easy Screen Writer (Unify)
- Function Key Procedures (Unify)

EXHIBIT A-11

END USERS' DESIRED PRE-SALE SUPPORT

Capability	Number of Mentions
Demo, "Play with It"	4
Access to Technical Staff	2
Generate Sample Programs	1
Access to Manuals	1
Understand Prospect's Application	1

EXHIBIT A-12

END USERS' DESIRED POST-SALE SUPPORT

Capability	Number of Mentions
Hotline, Access to Technical Support Persons	4
Fast Response to Questions	2
Good Documentation	1
Reasonably Priced Upgrades	1
Earlier Releases of Enhancements	1

EXHIBIT A-13

OTHER SERVICES DESIRED BY END USERS (One Mention Each)

- Information Exchange Between Users
- Bug Reporting
- Ability to Purchase Only Software Upgrades (vs. Full Maintenance Contract)

EXHIBIT A-14

IMPORTANCE OF SPECIFIC SUPPORT SERVICES TO END USERS (N=11)

Service	Rating (1-5)
Software Bug Fixes	4.54
Telephone Hotline Support	4.45
Software Updates	4.20
Published Bug List	4.10
Training for Software Developers and End Users	3.40
Consulting	2.70

Appendix: Tabulated VAR Responses

Appendix: Tabulated VAR Responses

EXHIBIT B-1

VARS' INSTALLED RDBMS

Vendor	Number Installed
Unify	5
Informix	3
Oracle	1
Safe Word	1
Total	10

EXHIBIT B-2

TOP 3 VAR RDBMS BUYING CRITERIA

Category	Criterion	Number of Mentions
Primary	Price	5
Secondary	Ease of Use	3
	Performance/Speed	3
	Compatibility with UNIX	2
	Portability	2
Tertiary	Easy Development Environment	1
	Reliability	1
	Functionality	1
	Data Integrity	1
	Flexible Program Interface	1

EXHIBIT B-3

VAR RATING OF SPECIFIC RDBMS BUYING CRITERIA (N=10)

Criterion	Average Rating (1-5)	
Software Development Features	4.5	
Pricing & Discount Structure	4.3	
Availability on Multiple Platforms	4.2	
RDBMS Vendor Reputation in Marketplace	4.0	
Data Base Administration Features	3.9	Tie
Performance	3.9	Tie
Technical Support	3.8	
RDBMS Vendor's Current Market Share	3.6	
Sales & Marketing Support	2.6	

EXHIBIT B-4

VAR DECISION-MAKING PROCESS FOR RDBMS

Major Steps

- All Use a Formal Process
- Key: Focus on Customer Needs, Future Directions
- Differentiators: Price, 3rd-Party Software Running under RDBMS

Decision-Makers in Large VARs

- Engineering Dept. Recommendation
- V.P. or General Manager Approval

EXHIBIT B-5

VARS' REASONS FOR SELECTING AN RDBMS VENDOR

Reason	Number of Mentions
Compatibility with Operating System(s)	4
Price	2
Power	2
Portability	1
Ease of Use	1
Easy-to-Create User Interface	1
Future Network Version	1
4GL	1
Efficient Development Tools	1

EXHIBIT B-6

OTHER RDBMS VENDORS CONSIDERED BY VARS

Vendor	Number of Mentions
Oracle	7
Informix	6
Ingres	2
Unify	1
Progress	1
Sybase	1

Perceived Large Market Share Most Often Cited as Reason for Considering Other RDBMS Vendors

EXHIBIT B-7

VAR SATISFACTION WITH PRIMARY RDBMS VENDOR

Vendor	Number of Responses	Average Score	Range (1-5)
Unify	4	4.5	4-5
Informix	4	4.3	4-5
Oracle	1	4.0	4
Sybase	1	4.0	4
Xanthe	1	4.0	4

EXHIBIT B-8

SECONDARY RDBMS RESOLD BY VARS

- 4 of 10 Companies Resell a Second RDBMS
- VARs Reselling a Second RDBMS Sell to Customers of All Sizes, Not Large/Medium Organizations Only
- Secondary Vendors Identified
  - Ingres
  - Informix
  - Sybase
- Key Selection Criteria
  - Market Share
  - Lower Price Points

EXHIBIT B-9

VARS' REASONS FOR NOT SELECTING CERTAIN RDBMS

Vendor	Weaknesses
Oracle	Performance (2) No 4GL (2) Price (2)
Informix	Performance (2) No 4 GL (2) Flat File/ISAM Access Price
Ingres	Flat File/ISAM Access Price

EXHIBIT B-10

IMPORTANCE OF SPECIFIC RDBMS FEATURES TO VARS

Criterion	Average Rating (1-5)	
Primary		
Form Generation and Windows	4.3	
ANSI Standard SQL	4.2	
Secondary		
Host Language Interface	4.1	
4GL	4.0	
Report Writers	3.9	> Tie
On-Line Help	3.9	
Transaction Control	3.8	
Tertiary		
Embedded SQL	3.3	
System-Generated Menus	3.25	

EXHIBIT B-11

ADDITIONAL FUNCTIONALITY DESIRED BY VARS

Strategic

- Distributed Processing (2, Unify)

Tactical

- More Tools (2, Oracle and Unify)
- Improved DBASE-to-UNIX Data Interchange (Informix)

EXHIBIT B-12

VARS' DESIRED PRE-SALE SUPPORT

Capability	Number of Mentions
Access to Technical Staff	2
Access to Source Code	1
Information on the Product	1

EXHIBIT B-13

VARS' DESIRED POST-SALE SUPPORT

Capability	Number of Mentions
Technical Support	5
Training for Software Developer's Staff	1
Extended Time for Bug Reporting	1
Good Documentation	1

EXHIBIT B-14

VARS' DESIRED "OTHER SERVICES" (One Mention Each)

- Longer Warranty
- Bulletin Board for Users
- Affordable Training
- Sample RDBMS-Based Applications
- Bug Updates

EXHIBIT B-15

IMPORTANCE TO VARS OF SPECIFIC SUPPORT SERVICES (N=10)

Service	Rating (1-5)
Software Bug Fixes	4.6 (Tie)
Published Bug List	4.6 (Tie)
Telephone Hotline Support	4.4
Software Updates	4.3
Training for Software Developers and End Users	3.2
Consulting	2.6

Appendix: Tabulated OEM Responses

Appendix: Tabulated OEM Responses

EXHIBIT C-1

OEMS' INSTALLED RDBMS

Vendor	Number Installed
Informix	4
Oracle	3
Unify	3
DEC DB2	1
RTI	1
Sybase	1
Progress	1
Total	14

(Multiple Responses Possible)

EXHIBIT C-2

TOP 3 OEM RDBMS BUYING CRITERIA

Category	Criterion	Number of Mentions
Primary	Market Acceptance	3
Secondary	Price/Cost of Porting	2
	Terms and Conditions	2
Tertiary	Availability	1
	Performance/Speed	1
	Build Solutions	1
	Product Diversity	1

EXHIBIT C-3

OEM RATING OF SPECIFIC RDBMS BUYING CRITERIA (N=6)

Criterion	Average Rating (1-5)	
Reputation of RDBMS Vendor in Market	4.5	
RDBMS Vendor's Current Market Share	4.3	
Sales and Marketing Support	4.2	
Pricing and Discount Structure	4.1	
RDBMS Runs on Multiple Platforms	4.0	
Performance	3.9	
Software Development Features	3.6	Tie
Data Base Administration Features	3.6	
Technical Support	3.3	

EXHIBIT C-4

OEM DECISION-MAKING PROCESS FOR RDBMS

Major Steps

- 3 of 4 Respondents Do Technical Evaluation
- RDBMS Product Acceptance in Marketplace Is Key Decision Factor

Decision Makers

- Product Marketing Manager, Director/V.P. of Marketing Always Participate
- 2 of 5 Include V.P. of Engineering
- 2 of 5 (Not Those Using V.P. of Engineering) Include the President

EXHIBIT C-5

OEMS' REASONS FOR SELECTING AN RDBMS VENDOR

Category	Reason	Number of Mentions
Primary	Market Share/Awareness	3
	Product Availability/Timing of Completed Porting	3
Secondary	Applications Available under Informix	1
	Terms and Conditions	1
	Cost of Porting	1

EXHIBIT C-6

OEM SATISFACTION WITH PRIMARY RDBMS VENDOR

Vendor	Number of Responses	Average Score	Range (L-H)
Unify	2	3.5	2-4
Informix	3	3.2	2-4
Oracle	2	2.0	2
RTI	1	2.0	2

EXHIBIT C-7

REASONS FOR OEMS NOT SELECTING OTHER RDBMS

OEM	RDBMS Vendor	Reasons
Amdahl	Informix	Not Supported on Mainframes
	Unify	Older Product; Limited Market Presence
	RTI	Limited Market Presence
Sony	Oracle	Cost of Porting RDBMS to Hardware
	Informix	Cost of Porting RDBMS to Hardware
	RTI	Cost of Porting RDBMS to Hardware
Ridge	Oracle	Time Needed for Porting

EXHIBIT C-8

IMPORTANCE OF SPECIFIC RDBMS FEATURES TO OEMS (N=5)

Criterion	Average Rating (1-5)
Primary	
4GL	4.4 > Tie
ANSI Standard SQL	4.4
Secondary	
Embedded SQL	4.3
Report Writers	4.2
Host Language Interface	4.0 > Tie
Transaction Control	4.0
Tertiary	
On-Line Help	3.6
Form Generation & Windows	3.4 > Tie
System Generation Menus	3.4

EXHIBIT C-9

ADDITIONAL FUNCTIONALITY DESIRED BY OEMS

Strategic
- Running on Mainframes

Tactical
- Ease of Customizing RDBMS
- Novice User Interface

EXHIBIT C-10

OEMS' DESIRED PRE-SALE SUPPORT

Capability	Number of Mentions
Good Technical Support	4
Demos & Demo Support	1
Documentation	1
Competitive Analysis of RDBMS Vendors	1
Training for Sales Reps	1
Collateral Material	1

EXHIBIT C-11

OEMS' DESIRED POST-SALE SUPPORT

Capability	Number of Mentions
Good/Responsive Technical Support	3
Sales & Marketing Assistance	1
Porting Assistance	1
Training for Sales Support Staff	1
Timely Software Updates	1
"800" Phone Number	1

EXHIBIT C-12

OEMS' DESIRED "OTHER SERVICES" (One Mention Each)

- Consulting
- Current Bug Lists
- Joint Marketing Assistance
- Training for Sales Support Personnel
- Assistance in Porting
- Ability to Port Part of Demo

EXHIBIT C-13

IMPORTANCE TO OEMS OF SPECIFIC SUPPORT SERVICES (N=5)

Service	Rating (1-5)
Software Bug Fixes	5.0
Software Updates	4.6 (Tie)
Telephone Hotline Support	4.6 (Tie)
Published Bug List	4.4
Training for Software Developers and End Users	3.6
Consulting	3.2

EXHIBIT C-14

OTHER RDBMS VENDORS CONSIDERED BY OEMS

Vendor	Number of Mentions
Ingres	4
Oracle	4
Informix	4
Unify	3
Sybase	1
Dataplex	1

Vendors Were Generally Considered Because They Are "Big Names" or Are Used by Existing Customers